

Claims

[c1] What is claimed is:

1.A method of manufacturing an LCD panel, the LCD panel comprising a first substrate positioned on a surface of an upper stage in a vacuum chamber and a second substrate positioned on a surface of a lower stage in the vacuum chamber, the first substrate and the second substrate having a predetermined gap between, the method comprising steps:
vacuuming the vacuum chamber and performing a horizontal alignment;
performing a first affixing process by applying a mechanical force for adhering the first substrate and the second substrate together with at least a dummy sealant;
and
performing a second affixing process by adjusting pressures of the vacuum chamber for further adhering the first substrate and the second substrate together with at least a main sealant installed inside the dummy sealant.

[c2] 2.The method according to claim 1 wherein the first substrate comprises at least an orientation pattern installed on an opposite surface of the first substrate cor-

responding to the upper stage.

- [c3] 3.The method according to claim 2 wherein the second substrate comprises at least an orientation pattern, parallel to the orientation pattern of the first substrate, installed on an opposite surface of the lower stage corresponding to the lower stage.
- [c4] 4.The method according to claim 1 wherein the predetermined gap is between 50 µm to 500 µm.
- [c5] 5.The method according to claim 1 wherein the second substrate further comprises a plurality of liquid crystal drops and spacers, and the main sealant surrounds the liquid crystal drops and spacers.
- [c6] 6.The method according to claim 1 wherein the main sealant and the dummy sealant are installed on the surface of the second substrate facing the first substrate.
- [c7] 7.The method according to claim 1 wherein the main sealant and the dummy sealant are installed on the surface of the first substrate facing the second substrate.
- [c8] 8.The method according to claim 1 wherein the first af-fixing process comprises:
providing a mechanical force for lowering the upper stage until the first substrate, carried by the upper stage,

tightly adheres to the second substrate with the dummy sealant.

- [c9] 9.The method according to claim 8 wherein the first affixing process further comprises a curing process for hardening portions of the dummy sealant.
- [c10] 10.The method according to claim 8 wherein the first affixing process further comprises a curing process for hardening the entire dummy sealant.
- [c11] 11.The method according to claim 1 wherein the second affixing process comprises:
releasing the first substrate carried by the upper stage for vertically lowering the first substrate until both the first substrate and the second substrate contact the main sealant; and
adjusting pressure in the vacuum chamber to a predetermined pressure value so that the first substrate and the second substrate are tightly affixed to the main sealant.
- [c12] 12.The method according to claim 11 wherein the second affixing process further comprises a curing process for hardening the main sealant and the dummy sealant.
- [c13] 13.The method according to claim 11 wherein the pre-determined pressure value is 1 atm.

- [c14] 14.The method according to claim 11 wherein the first affixing process lowers the upper stage with a mechanical force.
- [c15] 15.The method according to claim 1 wherein the second affixing process further comprises:
 - adjusting pressure in the vacuum chamber to a predetermined pressure value;
 - releasing the first substrate, carried by the upper stage, for vertically lowering the first substrate with the predetermined pressure until the substrate is tightly affixed to the main sealant; and
 - performing a curing process for hardening the dummy sealant and the main sealant.
- [c16] 16.The method according to claim 15 wherein the pre-determined pressure value is 1 atm.
- [c17] 17.The method according to claim 1 wherein the first affixing process comprises:
 - providing a mechanical force for raising the lower stage until the second substrate, carried by the lower stage, tightly adheres to the first substrate with the dummy substrate.
- [c18] 18.The method according to claim 17 wherein the first affixing process further comprises a curing process for

hardening portions of the dummy sealant.

- [c19] 19.The method according to claim 17 wherein the first affixing process further comprises a curing process for hardening the entire dummy sealant.
- [c20] 20.The method according to claim 6 wherein the first affixing process raises the lower stage with a mechanical force until the dummy sealant tightly adheres to the first substrate.
- [c21] 21.The method according to claim 20 wherein the second affixing process comprises:
adjusting pressure in the vacuum chamber to a predetermined pressure value;
releasing the first substrate, carried by the upper stage, for vertically lowering the first substrate with the predetermined pressure until the substrate is tightly affixed to the main sealant; and
performing a curing process for hardening the dummy sealant and the main sealant.
- [c22] 22.The method according to claim 21 wherein the pre-determined pressure value is 1 atm.
- [c23] 23.The method according to claim 1 further comprising:
providing a pressure-enhancing film installed between the first substrate and the upper stage, wherein the

pressure-enhancing film has a salient on the fringe, and the salient corresponds to the locations of the dummy sealant.

[c24] 24. The method according to claim 1 further comprising: providing a pressure-enhancing film installed between the second substrate and the lower stage, wherein the pressure-enhancing film has a salient on the fringe, and the salient corresponds to the locations of the dummy sealant.